A virtual lifesaver

Simulation centers prepare soldiers for bloody toll of war

By Jack Weible

The U.S. Army's first — and so far, only — medical simulation program is gearing up to expand the ability of medics and first responders to respond knowledgeably to battlefield injuries.

Medical Simulation Training Centers (MSTCs) were just a blueprint 2½ years ago but are now established at 10 sites in the continental U.S., along with locations in Alaska, Germany, Kuwait, Afghanistan and Iraq. Three more will be fielded in 2008 on U.S. soil, bringing the total to 18.

"This program didn't exist 2½ years ago," said Maj. Dave Thompson, the assistant product manager for MSTCs at the Army's Program Executive Office for Simulation, Training & Instrumentation (PEO STRI), which oversees the effort. Because the wars in Iraq and Afghanistan were causing a surge in battle-inflicted wounds, the Army had a decision to make.

"They could do it fast, do it cheap or do it good," Thompson said. The service didn't ignore quality, but speed came first. At the service's bequest, PEO STRI worked furiously to make the 18 centers a reality. "By doing that, we've had to sacrifice standardized platforms," Thompson said, and as a result, although the systems provide vital training, it's not the same at every location.

"The useful thing to do is to get at the original requirements and provide standardized training platforms," he said.

The centers cost about $1.7 million apiece and are designed to provide the Army's combat medical advanced skills training for medics and combat lifesaver training for nonmedical personnel. Each center is about 60 feet by 80 feet (4,800 square feet), can offer both classroom and field instruction, and encompasses four elements. Thompson describes the MSTC as "a family of systems,

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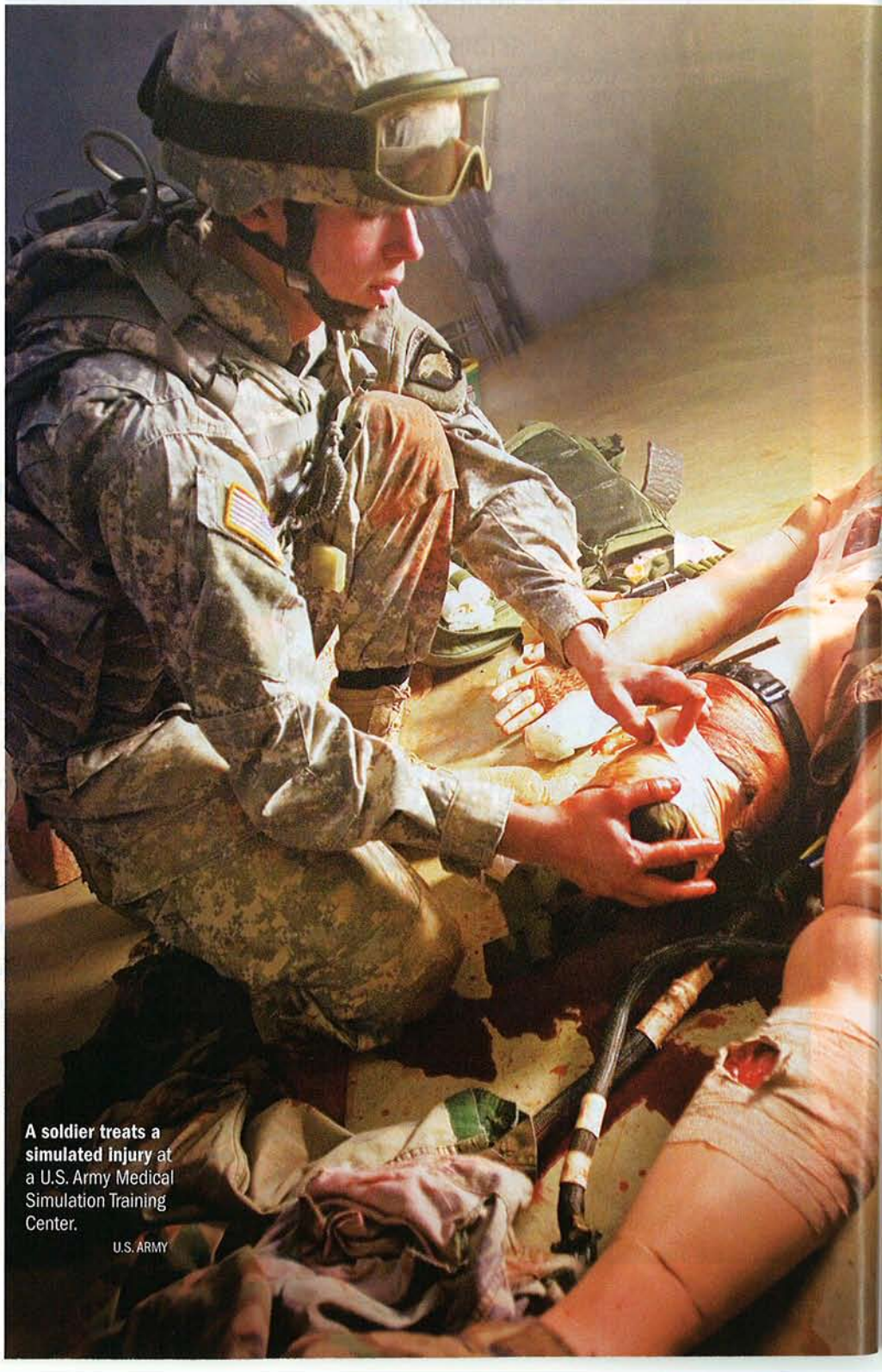

A soldier treats a simulated injury at a U.S. Army Medical Simulation Training Center.

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with four subsystems and inside each of those subsystems, they have components." Those subsystems are:

- The Virtual Patient System.
- The Instruction Support System (ISS).
- Medical Training Command and Control (MT-C2).
- The Medical Training Evaluation and Review System (MeTER).

The four systems are integrated so that each is dependent on the other to operate.

The Virtual Patient System provides the actual patient training devices. Those devices include patient, airway and dead-weighted tethered mannequins, partial task trainers such as "arms" and "legs," kits for trauma and moulage (makeup materials for creating wounds), and other associated equipment. Medics and combat lifesavers, for example, will find that the dead-weight mannequins weigh 180 pounds plus up to 40 pounds of combat gear.

Training takes place in four so-called "validation rooms" that surround the centralized MT-C2 room where operators can manipulate the environment for the soldiers. Thompson compared the control room to a board game of Oz, with the operator serving as "the man behind the curtain" who can "manage the training platforms, both inside and outside."

The MT-C2 simulates the stressors that can impede treatment on the battlefield, including hostile and friendly-force engagement, low light, fog, battlefield noise and debris. "It also has the ability to bring in new training scenarios," Thompson said.

Those existing and new scenarios are done in integration with the Instructor Support System to allow adjustments both to the process and the training devices used.

The ISS, which includes four 400-square-foot classrooms for indoor training but also outdoor instruction, is designed to provide common programs for instruction by way of skilled medical instructors and accompanying administrative, supply and technical support. It's also designed for virtual training.

Training without review can prove meaningless, and that is where the MeTER comes into play.

"It's the metrics capability. So when you come in, I can give you a test to determine where you are right now. I can focus your training experience, then after the training sequence, I can retest you and determine what that goodness of training did, how much you improved," Thompson said. "And if you still have needs, I can test you in three areas."

The first is technical medical knowledge — "One plus one equals two," Thompson said — and the second is applying that book knowledge to a live patient. But most critical is tactical knowledge, he said.

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Each Medical Simulation Training Center includes validation rooms where the Virtual Patient System provides hands-on experience.

"Can you make those decisions in a tactical environment? You can be as book smart as you want to be, but if you pop up and you're not supposed to pop up, and you get hit, you're not doing anybody any good. You've got to be able to combine all three of those pieces."

MeTER allows real-time audio and video reviews and reference points linked to objective data recordings. That provides a full review of trainees' ability to apply the medical skills they've learned.

LIFE-CYCLE APPROACH

Thompson said PEO STRI is taking an "acquisition life-cycle approach" to the MSTCs. "We are not just interested in widgets on the ground; we're interested in the system and the life cycle of that system." That means not only providing initial training through the centers, but also reinforcing that training throughout a soldier's career.

The MSTCs have drawn positive reviews everywhere they've been introduced, Thompson said — "The commander at Fort Drum, [N.Y.], has determined that MSTC will be the focal point for medical training for the 10th Mountain Division" — but the task now is to determine how many more centers are needed. Training and Doctrine Command (TRADOC) officials have indicated that, eventually, every soldier coming out of basic training should have combat lifesaving certification, Thompson said, but that's a far bigger load than the existing MSTCs can handle.

Standard training in the MSTC is four days for Army medics and five days for a first responder. Using the MeTER system, program officials are eyeing an approach at customizing the training experience.

"So we can do a training sequence and if we realize you have a debit in your ability, instead of continuing on with you because we've got to get whole group through, what we need to do is identify that at that moment and then put you back through that particular piece of training," Thompson said. And although the overall goal is standardized training, each soldier's ability to learn would be customized.

Another promising aspect for the MSTCs is the capability for interdepartmental, joint and coalition training. "At Fort Lewis, [Wash.], if they have time, they're training [Environmental Protection Agency] personnel. At Fort Riley, [Kan.], they're training global first responders," he said. And the Saudi Arabian National Guard has expressed interest in training at a center, as well.

While outside groups pay to use the MSTCs, helping the centers sustain themselves, Thompson said he believes the future bodes bigger things.

"What if we train interdepartmentally in medical simulation, so that as we respond to the next catastrophe, we are already training with other departments, such as the Department of Homeland Security?" he asked. "We would know how they operated; they would know how we operated. Not so much at the strategic level but at the user level."

For now, PEO STRI and Army commands such as TRADOC must determine what the Army's need is for the MSTCs, especially if medical simulation training is to spread beyond the initial target of medics and first responders.

"We know that the original team [of centers] do not meet the Army's training requirements," Thompson said. ■

Where the sim centers are

The U.S. Army fields Medical Simulation Training Centers at 10 locations in the continental U.S., plus one each in Alaska, Kuwait, Afghanistan and Vilsack, Germany. There is also a deployable center in Balad, Iraq. Three more MSTCs are slated to open this year.

The list of MSTCs in the U.S.:

- Fort Bliss, Texas
- Fort Bragg, N.C.
- Fort Campbell, Ky.
- Fort Carson, Colo.
- Fort Drum, N.Y.
- Fort Hood, Texas
- Fort Lewis, Wash.
- Fort Riley, Kan.
- Camp Shelby (National Guard), Miss.
- Fort Stewart, Ga.
- Fort Wainright, Alaska

MSTCs to open this year are at Schofield Barracks, Hawaii; Fort Dix, N.J.; and Fort McCoy (Army Reserve), Wis.

SOURCE: PEO STRI

When complete, Jordan's King Abdullah II Special Operations Training Center will cover 500 acres.

GENERAL DYNAMICS

Live-fire spectacle

Jordan's special ops center will be largest of its kind

By Jack Weible

What U.S. Army and industry officials are touting as the most capable live-fire training site in the world is taking shape in Jordan with a scheduled grand opening in January.

The King Abdullah II Special Operations Training Center (KASOTC) will enable U.S. special operations units and those from coalition forces to hone their skills via a network of 56 buildings developed for fighting military operations on urban terrain, better known as MOUT training, and more. The 500-acre site, located in Yajooz just outside the capital, Amman, has been under construction since autumn 2006 and, when completed, will be a focal point for U.S. and Jordanian special operations units and other regional allies to learn how to counter terrorist threats in that part of the world.

"It's going to be the ultimate training center for special operations; it will be one of a kind," said Dick Coltman, group vice president at General Dynamics Information Technology division. The GD unit received a $17 million contract to instrument the site as part of $99 million given to Jordan as part of the U.S. Foreign Military Sales system, and is compressing its instrumentation work from nine to six months to deal with an expected immediate demand from the special operations community.

Initial operational capability is expected by September, said U.S. Army Maj. Rod Aleandre, assistant product manager of digitized training for urban operations at the service's Program Executive Office for Simulation, Training & Instrumentation, which is acting as executive agent for construction along with the Army Corps of Engineers under the direction of U.S. Special Operations Command-Central. Along with the scores of buildings going up for urban training, users will have access to 100- and 200-meter weapons ranges and a mock-up of an A300 aircraft fuselage to practice hostage rescue and other missions.

"When you put it all together, it becomes the largest training complex of its kind in the world," Aleandre said.

The terrain at KASOTC is tremendously uneven and has steep cliffs, which requires extensive machinery to sculpt the site. "In the original pictures, it looks like the Grand Canyon and like you just carved it out," Coltman said. "There's a lot of earth work being done."

The regional training center is named after the Jordanian king, who has been a staunch ally to the U.S. since becoming monarch following the death of his father, King Hussein, in February 1999. The 46-year-old king headed Jordanian special forces for three years in the 1990s.

The site at Yajooz is one of three KASOTCs in Jordan that eventually will train special operations forces; a second in Zarqa "will basically be a sniper, range-like complex," Coltman said, and a third in Aqaba on the Red Sea was to be constructed for close-quarter battle training for U.S. Navy SEALs but is now being reassessed.

Construction costs at the Yajooz location have eaten up all the funding once targeted for the three KASOTCs, officials said, and it's unclear when work at the remaining two sites will commence.

All training at Yajooz will be live; there are no simulators for virtual or constructive training. But the live training capabilities are top-flight.

"This package will allow you to record in real time for the training that's taking place and also allow you to change the scenario to the current training efficiencies that are in demand," Aleandre said. "We also have an after-action-review capability where you can replay the whole training scenario and then tag the area that you want to review and create a take-home package. So whatever you learn at the site, you can review it back home and analyze it for further training."

The site can deal with battalion-sized forces — dormitories will be built on site to handle more than 600 troops — and has been designed for both joint training and coalition training.

Although the U.S. will have use of the center, it will be run by Jordan. Coltman said contractual arrangements between the two countries are being worked out. Other nations will use the facility on a "pay as you go" approach, and Jordan is responsible for maintaining the KASOTC.

General Dynamics officials have indicated in earlier interviews that the site will offer a wide range of ancillary systems to improve MOUT scenarios. Those systems include area weapon effects through concussion-wave generators along with smoke generators, rooftop explosions and exploding gas pumps.

The company also is providing thousands of individual sound effects and more than 100 olfactory effects.

Also available will be the third version of the Human Urban Target, which has hit-sensing circuitry to distinguish lethal from non-lethal hits.

"In the United States, there is no facility, an actual MOUT facility, where they use live fire," Coltman said. "We've used paintballs, we've used [the Multiple Integrated Laser Engagement System built by Cubic], but this is a new concept for us. ■